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# Preliminary Results from a Holocene Record from Crystal Lake, Southwestern Ohio

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# PRELIMINARY RESULTS FROM A HOLOCENE RECORD FROM CRYSTAL LAKE, SOUTHWESTERN OHIO

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Initial studies of a core of lake sediment from Crystal Lake (39° N 53', 84° W 01'), an 11-meter-deep kettle lake in southwestern Ohio indicate considerable short-term variability and long-term change in water depth and alkalinity over parts of the Holocene.

We did stratigraphic descriptions, loss-on-ignition analysis, and preliminary diatom, mollusk and plant macrophytes analyses of several sections of a core taken by Dr. Tom Lowell, Dr. Songlin Cheng, and other colleagues. Our initial findings indicate considerable changes in depth and lake chemistry in the early-to-mid-Holocene, and between the mid-Holocene and the present.

The top meter of sediment shows little color change, but the calcium carbonate content varies from 38-74% according to loss-on-ignition analysis. Diatom valves in these levels are mostly those of araphid taxa, particularly *Synedra*. The bottom half of the core is visibly laminated with some distinct color changes. Calcium carbonate varies from >1% to 77% of dry weight. The diatom flora and mollusk fauna include taxa that are tolerant of lake level and alkalinity changes, such as *Navicula oblonga*. Most of the diatoms in these levels are centric, possibly indicating less eutrophic conditions and/or deeper water in the early-to-mid-Holocene compared to present lake conditions.

The modern lake is eutrophic and has a wide calcium carbonate shelf filling most of the basin, except for an area near the middle from which the core was taken. The growth of this shelf may have created shallow water habitats and greatly affected carbon cycling within the lake. Cores from the shelf will give us an idea of when it began to develop and how quickly it did so. Further studies to be performed on the core from the deep part of the lake include AMS dating of plant macrofossils, pollen analysis, and more diatom work.

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